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10/671,933	09/29/2003	Fred Gehrung Gustavson	YOR920030168US1	8292

48150 7590 12/19/2006	EXAMINER	
MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC	DO, CHAT C	
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SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/19/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _9/29/03; 12/22/03; 9/11/06; and 11/21/06_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-25_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _22 December 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-SB/08)
Paper No(s)/Mail Date _11/21/06; 9/11/06_.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Specification

1.   The disclosure is objected to because of the following informalities:

        The applicant is advised to update information cited in the "Cross-Reference to

Related Applications" section.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

3.   Claims 1-25 are rejected under 35 U.S.C. 101 because the claimed invention is directed

to non-statutory subject matter.

        Claims 1-25 cite a method of converting a triangular data into a rectangular data

according to an algorithm. In order for a claimed invention that is directed to such a

computer implemented method of calculation, or an apparatus that is no more than a

general computer implementing the method of calculation to be statutory, the claimed

invention must accomplish a practical application or include a concrete, useful, and

tangible result. That is the claimed invention must transform an article or physical object

to a different state or thing, or produce a useful, concrete and tangible result. State Street,

149 F.3d at 1373-74, 47 USPQ2d at 1601-02. Also see "Interim Guidelines for

Examination of Patent Applications for Patent Subject Matter Eligibility", OG Notices:

22 November 2005. However, claims 1-25 merely disclose steps of converting and

manipulating data format in matrix without regarding to any particular practical

application or a tangible result. In addition, claims 15-17 are directed to signal medium,

which are clearly not statutory. Therefore, claims 1-25 are directed to non-statutory

subject matter.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this ·
or a foreign country, before the invention thereof by the applicant for a patent.

5.   Claims 1-3, 7-17, 21-23, and 25 are rejected under 35 U.S.C. 102(a) as being anticipated

by Garg (U.S. 6,601,080).

Re claim 1, Garg discloses in Figures 1-10 a computerized method of linear

algebra processing (e.g. abstract and col. 1 lines 11-19), method comprising: processing a

matrix data of a triangular packed format matrix in at least one matrix subroutine

designed to process matrix data in a full format (e.g. Figures 5 and 10; col. 5 lines 28-51

for efficient storage and computation), using a hybrid full-packed data structure, wherein

hybrid full-packed data structure provides a rectangular data structure for triangular

packed data (e.g. col. 11 line 57 to col. 12 line 15 wherein the routine converts triangular

matrix to 2-D rectangular matrix for the supernodes).

Re claim 2, Garg further discloses in Figures 1-10 converting matrix data from triangular packed format into hybrid full-packed data structure (e.g. Figures 5 and 10 wherein the routine converts a triangular matrix shape to 2-D rectangular matrix for the supernodes).

Re claim 3, Garg further discloses in Figures 1-10 hybrid full-packed data structure comprises: a square portion of triangular packed data (e.g. 'B' in Figure 7); a first triangular portion of triangular packed data (e.g. lower triangular right above 'B' portion of the supernode 402 in Figure 7); and a second triangular portion of triangular packed data (e.g. upper triangular right above 'B' portion of the supernode 402 in Figure 7), wherein square portion, first triangular portion, and second triangular portion are fitted together to form rectangular data structure (e.g. supernode 402 in Figure 7).

Re claim 7, Garg further discloses in Figures 1-10 converting comprises: determining a portion of matrix data stored in triangular packed format that would comprise a square portion having a dimension approximately one half a dimension of triangular packed format (e.g. 'B' in Figure 7 wherein 'B' can be approximately one half of a size of the triangular right above).

Re claim 8, Garg further discloses in Figures 1-10 fitting a first triangular portion of matrix data stored in triangular packed format into a first location relative to data of square portion (e.g. lower triangular right above 'B' portion of the supernode 402 in Figure 7); and fitting a second triangular portion of matrix data stored in triangular packed format into a second location relative to data of square portion (e.g. upper triangular right above 'B' portion of the supernode 402 in Figure 7); wherein first

triangular portion, second triangular portion, and square portion fit together to form

rectangular data structure (e.g. supernode 402 in Figure 7).

Re claim 9, Garg further discloses in Figures 1-10 converting a result of

processing of matrix data from hybrid full-packed data structure into a triangular packed

data format (e.g. a reverse process of packed rectangular data from triangular data format

in Figure 5 and 10).

Re claim 10, it is an apparatus claim of claim 1. Thus, claim 10 is also rejected

under the same rationale as cited in the rejection of rejected claim 1.

Re claim 11, it is an apparatus claim of claim 2. Thus, claim 11 is also rejected

under the same rationale as cited in the rejection of rejected claim 2.

Re claim 12, it is an apparatus claim of claim 3. Thus, claim 12 is also rejected

under the same rationale as cited in the rejection of rejected claim 3.

Re claim 13, it is an apparatus claim of claim 5. Thus, claim 13 is also rejected

under the same rationale as cited in the rejection of rejected claim 5.

Re claim 14, it is an apparatus claim of claim 6. Thus, claim 14 is also rejected

under the same rationale as cited in the rejection of rejected claim 6.

Re claim 15, it is a signal claim of claim 1. Thus, claim 15 is also rejected under

the same rationale as cited in the rejection of rejected claim 1.

Re claim 16, it is a signal claim of claim 2. Thus, claim 16 is also rejected under

the same rationale as cited in the rejection of rejected claim 2.

Re claim 17, it is a signal claim of claim 3. Thus, claim 17 is also rejected under

the same rationale as cited in the rejection of rejected claim 3.

Re claim 21, it has similar limitations cited in claim 7. Thus, claim 21 is also

rejected under the same rationale as cited in the rejection of rejected claim 7.

Re claim 22, it has similar limitations cited in claim 8. Thus, claim 22 is also

rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 23, it has similar limitations cited in claim 3. Thus, claim 23 is also

rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 25, it has similar limitations cited in claim 2. Thus, claim 25 is also

rejected under the same rationale as cited in the rejection of rejected claim 2.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   Claims 4-6, 18-20, and 24 are rejected under 35 U.S.C. 103(a) as being obvious over

Garg (U.S. 6,601,080) in view of Philip et al. ("PLAPACK: Parallel Linear Algebra Package

Design Overview").

Re claim 4, Garg does not disclose in Figures 1-10 at least one matrix subroutine

designed to process matrix data in full format comprises at least one of a packed

triangular matrix subroutine and a symmetric matrix subroutine of a LAPACK (Linear

Algebra PACKage) software package. However, Philip et al. disclose at least one matrix

subroutine designed to process matrix data in full format comprises at least one of a

packed triangular matrix subroutine and a symmetric matrix subroutine of a LAPACK

(Linear Algebra PACKage) software package (e.g. abstract). Therefore, it would have

been obvious to a person having ordinary skill in the art at the time the invention is made

to add at least one matrix subroutine designed to process matrix data in full format

comprises at least one of a packed triangular matrix subroutine and a symmetric matrix

subroutine of a LAPACK (Linear Algebra PACKage) software package as seen in Philip

et al.' invention into Garg et al.'s invention because it would enable to overcome the

complexity of performing parallel computation (e.g. page 1 under introduction section).

Re claim 5, Garg further discloses in Figures 1-10 at least one matrix subroutine

comprises a variant of a corresponding full format routine of a LAPACK level 3 BLAS

(Basic Linear Algebra Subroutine) (e.g. col. 2 line 22-35).

Re claim 6, Garg further discloses in Figures 1-10 level 3 BLAS comprises an L1

kernel routine, wherein L1 comprises an L1 cache in a computer, L1 cache comprising a

cache closest to one of a CPU (Central Processing Unit) and an FPU (Floating-Point

Processing Unit) in computer (e.g. col. 7 lines 38-56).

Re claim 18, Garg further discloses in Figures 1-10 a method of at least one of

solving and applying a scientific/engineering problem (e.g. col. 1 lines 11-35), method

comprising at least one of: using a linear algebra software package that computes one or

more matrix subroutines, wherein linear algebra software package processes a matrix data

of a triangular packed format matrix in at least one matrix subroutine (e.g. Figures 5 and

10; col. 5 lines 28-51 for efficient storage and computation), using a full-packed data

structure, wherein hybrid full-packed data structure provides a rectangular data structure

for triangular packed data (e.g. col. 11 line 57 to col. 12 line 15 wherein the routine

converts triangular matrix to 2-D rectangular matrix for the supernodes); providing a

consultation for solving a scientific/engineering problem using linear algebra software

package (e.g. col. 2 lines 11-35 with library). Garg fails to disclose a step of transmitting

a result of linear algebra software package on at least one of a network, a signal-bearing

medium containing machine-readable data representing result, and a printed version

representing result; and receiving a result of linear algebra software package on at least

one of a network, a signal-bearing medium containing machine-readable data

representing result, and a printed version representing result. However, Philip et al.

disclose a step of transmitting a result of linear algebra software package on at least one

of a network, a signal-bearing medium containing machine-readable data representing

result, and a printed version representing result; and receiving a result of linear algebra

software package on at least one of a network, a signal-bearing medium containing

machine-readable data representing result, and a printed version representing result (e.g.

abstract and page 1 under the introduction section wherein the library is distributed to

network processors for processing). Therefore, it would have been obvious to a person

having ordinary skill in the art at the time the invention is made to add a step of

transmitting a result of linear algebra software package on at least one of a network, a

signal-bearing medium containing machine-readable data representing result, and a

printed version representing result; and receiving a result of linear algebra software

package on at least one of a network, a signal-bearing medium containing machine-

readable data representing result, and a printed version representing result as seen in

Philip et al.' invention into Garg et al.'s invention because it would enable high performance parallel computing (e.g. page 1 under introduction section).

Re claim 19, it has limitations cited in claim 4. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Re claim 20, it has limitations cited in claim 3. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 24, it has limitations cited in claim 18. Thus, claim 24 is also rejected under the same rationale as cited in the rejection of rejected claim 18.

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.   U.S. Patent No. 5,983,230 to Gilbert et al. disclose an order sparse accumulator and its use in efficient sparse matrix computation.

b.   U.S. Patent No. 7,031,994 to Lao et al. disclose a matrix transposition in a computer system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

December 13, 2006